The Arctic Biodiversity Assessment

Work Plan and Financial Strategy

CAFF
Conservation of Arctic Flora and Fauna

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Finnish Ministry of the Environment, Helsinki, Finland

Ministry of the Environment and Nature, Greenland Homerule, Greenland (Kingdom of Denmark)

Faroese Museum of Natural History, Tórshavn, Faroe Islands (Kingdom of Denmark)

Icelandic Institute of Natural History, Reykjavik, Iceland

Directorate for Nature Management, Trondheim, Norway

Russian Federation Ministry of Natural Resources, Moscow, Russia

Swedish Environmental Protection Agency, Stockholm, Sweden

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CAFF Designated Area

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Introduction

The Conservation of Arctic Flora and Fauna (CAFF) *Flora & Fauna: Status and Conservation* report and the *Arctic Climate and Impact Assessment* (ACIA) indicated that it was necessary to consider the status and trends of biodiversity in the Arctic. The ACIA also called for improved capacity to monitor and understand changes in the Arctic. The proposed Arctic Biodiversity Assessment (ABA) and the Circumpolar Biodiversity Monitoring Program (CBMP) are two of the primary vehicles via which the CAFF Working Group of the Arctic Council is responding to these calls.

The CBMP is contributing to harmonizing and enhancing circumpolar biodiversity monitoring efforts, which will enhance our ability to detect and report on significant trends and stressors. The ABA in turn will provide policy makers and conservation managers with a synthesis of the most current scientific research and Traditional Ecological Knowledge (TEK) on Arctic biodiversity. This information is necessary for the governments, organisations, and peoples of the Arctic region to help ensure sustainability of Arctic biodiversity and Arctic communities. The ABA will highlight the main stressors to Arctic biodiversity and will provide a foundation for the subsequent development of adaptation strategies. In addition, the ABA is the Arctic Council's response to the United Nations Environment Programme (UNEP)/ Convention on Biological Diversity (CBD) 2010 global target to halt or significantly reduce the current rate of biodiversity loss; and UN Millennium Development Goal number 7 to ensure environmental sustainability.

In October 2006, CAFF received full endorsement to proceed with the ABA[1]. The ABA will be a product of the Arctic Council through the CAFF Working Group. All member states and permanent participants to the Arctic Council will be involved in producing this assessment.

1 Purpose and Objectives

The purpose of the ABA is to:

Synthesize and assess the status and trends of biological diversity in the Arctic

This will create a baseline for use in global and regional assessments of Arctic biodiversity and inform future Arctic Council work. This baseline will be used to:

- Identify gaps in the data record
- Identify the main stressors
- Identify key mechanisms driving change
- Produce recommendations

2 General approach and Deliverables

The ABA is a dynamic assessment and consists of multiple activities that will be a springboard for future developments. The ABA will deliver multiple products and its primary deliverables and timeframes are:

1. A 2010 Summary Report based upon the CBMP indicators
2. An in depth scientific report – starting simultaneously and completed by 2012
3. An overview report for policy makers and conservation managers completed by 2013
4. Policy Recommendations completed by 2013
5. Supporting products - e.g. multimedia products and translations

3 Related initiatives:

3.1 Other Arctic assessments

Arctic biodiversity sections in previous and on-going assessments will provide valuable sources of information. These will include: CAFFs CBMP; Arctic Monitoring and Assessment Programme (AMAP) e.g. AMAP 2004, 2005; Protection of the Arctic Marine Environment (PAME); the soon to be published

[1] Arctic Council Ministers, Salekhard Declaration, 2006

Arctic Council Oil & Gas Assessment; the Nordic 2010 Biodiversity Assessment; Impacts of climate change on biodiversity and ecosystem goods and services in the Barents Region; the Canadian Ecosystem Status and Trends Report; NOAA's State of the Arctic reports and other global biodiversity assessments.

Some Arctic agreements that govern management of specific aspects of biodiversity in the north also collect information on status and trends. These include the International Polar Bear Convention (1973), and various multilateral and bilateral agreements e.g. the Migratory Birds Convention (1916) and the Porcupine Caribou Management Agreement (1987) between the USA and Canada.

3.2 United Nations Convention on Biological Diversity (CBD)

Most of the Arctic Council countries are parties to the CBD. These countries will be compiling information on status and trends of their national biodiversity for their Fourth National Reports to the CBD, due March 30th, 2009. The ABA will be able to make use of some of this information. The CBD will draw upon a variety of information, including national reports but also regional reports such as the ABA, to produce the Third Global Biodiversity Outlook.

3.3 UNEP Global Environment Outlook 4 (GEO-4)

GEO-4 contains several chapters of relevance to the ABA, including chapters on biodiversity and Polar Regions. Technical information compiled for GEO-4 will be available for use by the ABA.

3.4 UNEP/GRID-Arendal and UNEP-World Conservation Monitoring Centre (WCMC)

Although a comprehensive ABA has not yet been prepared, some UN agencies, such as UNEP/GRID-Arendal have produced theme maps relevant to the ABA (Ahlenius 2005, 2007; Ahlenius et al. 2005). These are supported by technical reports, and the WCMC has also published on related themes (Chape et al. 2005; Groombridge & Jenkins 1998, 2002; Groombridge & Jenkins 1996b; UNEP 2003; Zöckler 1998; Zöckler & Lysenko 2000). These reports will provide useful input to the ABA.

3.5 Other International Biodiversity Conventions

Several other international biodiversity conventions produce useful information on status and trends in biodiversity relevant to the Arctic. These include:

- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- The Convention on the Conservation of Migratory Species of Wild Animals (CMS, or the Bonn Convention)
- African-Eurasian Waterbird Agreement (AEWA)
- The Convention on Wetlands of International Importance (The Ramsar Convention)
- World Heritage Convention (WHC)

4 2010 Summary Report on the CBMP Indicators

The first product of the ABA will be an indicators report compiling and synthesizing the available data on the CBMP indicators. CBMP has chosen a suite of indices and indicators that provide a picture of the state of Arctic biodiversity. They reflect the two-pronged approach of the CBMP (ecosystem and species network approaches) and were chosen through an expert consultation process to reflect existing monitoring capacity and expertise.

Criteria used to select the indicators included sensitivity to natural or anthropogenic drivers; understandability to a non-technical audience; scientific validity, relevance to diverse audiences (e.g., local communities, decision makers, the global public); ecological relevance; sustainability of monitoring capacity; subjection to targets and thresholds; and practicality.

The indicators and indices were also chosen to represent and incorporate information from all major Arctic biomes at various scales, known Arctic stressors, all major trophic levels, all major Arctic biodiversity components (e.g. genes, species and habitats) including humans, critical ecosystem services and functions using both community and science based monitoring approaches. The Indicator themes in the CBMP are:

1. Species e.g. trends in caribou, polar bears, seabirds, salmon.
2. Ecosystem Structure e.g. Arctic trophic index.
3. Habitat Extent e.g. tundra, forests, sea ice.
4. Habitat Quality e.g. habitat fragmentation.
5. Ecosystems Function and Services e.g. forest fires, insects outbreaks, plant phenology.
6. Human Health and Well-Being e.g. traditional food and medicine, pathogens in wildlife.
7. Policy Responses e.g. protected areas, status of threatened species.

4.1 Work Plan Organization for CBMP Indicators

The indicators for the CBMP have already been identified through the development of the implementation plan for the CBMP. Two workshops have been held, one which created a preliminary list of indicators and a wider consultation which finalized the list of indicators. These have been published in the CBMP 5 Year Overview Implementation Plan approved by the SAOs in April, 2007.

4.2 Information, Acquisition, Analysis Writing

The information to support the indicators will be provided by the CBMP species networks and expert groups as well as the CAFF countries. Experts for groups of indicators in a theme area will be responsible for compiling the data, synthesizing and analyzing the information, documenting the methodologies for data collection and analysis and preparing draft explanatory text. The indicators report is envisioned as a short, highly graphical and succinct report explaining the trends.

5 In-depth Scientific Report (Suggested Sections)

All sections will include status and trends data, analysis on key data gaps, considerations on ability to support species diversity, the value and impacts to human societies, stressors and drivers of ecological change, cumulative effects of multiple stressors, and anticipated future trends. Special focus will be given to climate change throughout the report.

5.1 Introductory topics

Introductory sections will provide the context of the ABA and describe the unique features of Arctic ecosystems and ecological processes. Physical and geographical (and oceanographic for marine systems) features that drive development of ecosystems will be included. Also included will be a discussion of stability and fragility in Arctic ecosystems.

Large Marine Ecosystems, as put forward by PAME will be used as a baseline for the marine environment. The baseline for terrestrial ecosystems will be defined using the work of the Flora Group of CAFF, the Circumpolar Arctic Vegetation Map and the Circumpolar Boreal Forest Map (now under development).

5.2 Species account

Sections on species may be partially informed by chapter 6 of the Arctic Councils Oil & Gas Assessment and similar assessment work (see 7.5 and 8.0). Sections on species might include:

- Vertebrates (marine, freshwater, and terrestrial): all regularly occurring species;
- Vascular plants (marine, freshwater, and terrestrial): all regularly occurring species;
- Invertebrate species - where data allows and it is of significance to the scope of the assessment.

5.3 Terrestrial Ecosystems

The diversity of ecosystems will be described using global, regional and national classification systems as applicable.

5.4 Aquatic (Freshwater) Ecosystems

Freshwater ecosystems will include major rivers in the CAFF area i.e. Mackenzie (Canada); Yukon (Canada, USA); Yenisey (Mongolia, Russia); Lena (Russia); Pechora (Russia); Kolyma (Russia); Ob (China, Kazakhstan, Russia). The ABA may also include rivers originating outside of the Arctic that discharge into it as well as smaller rivers and lakes that are important nationally or regionally.

5.5 Marine Ecosystems

Presentation of data and analyses will be based on the work of the PAME Working Group and their development of a working map of Large Marine Ecosystems. As far as possible, the ABA will follow what was outlined in the Arctic Marine Strategic Plan (AMSP) as applied to Arctic marine biodiversity and protected areas.

5.6 Ecosystem Goods and Services

The ABA will discuss the cultural, social and economic values of biodiversity to society. In its analysis it will recognize that there is a strong relationship between the well-being of people and the state of biodiversity. The dependence of Arctic residents on healthy ecosystems will be reflected in the suite of indicators chosen and the relationships described. For example, the report could describe trends in the availability of particular species that are essential to maintain a traditional life style and the consequences of changes in the abundance of those species to Arctic residents.

5.7 Genetic Diversity

At low population levels a species' genetic diversity determines its effective population size and whether its numbers may further decline or fail to increase with protection. This is due to factors such as inbreeding depression and genetic drift. The diversity of genotypes within a meta-population may determine whether a species can adapt to changing conditions. To the extent possible ABA will include such aspects.

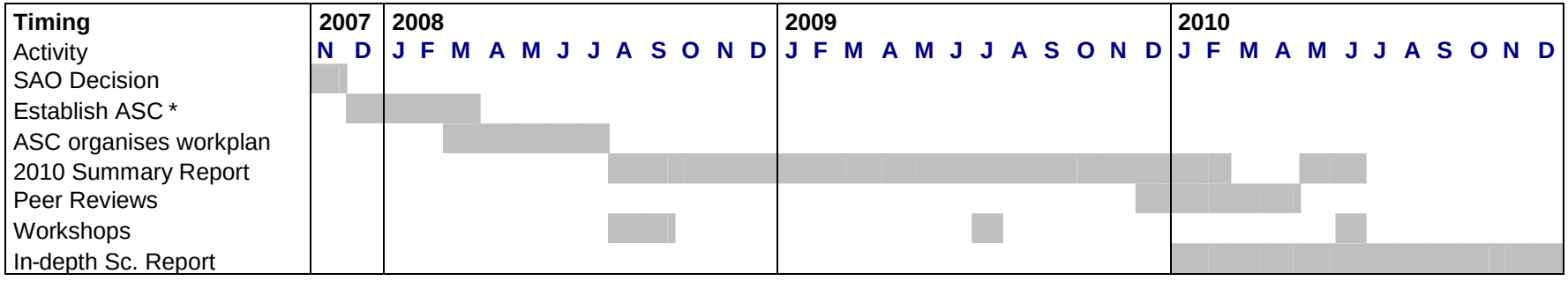
6 Schedule

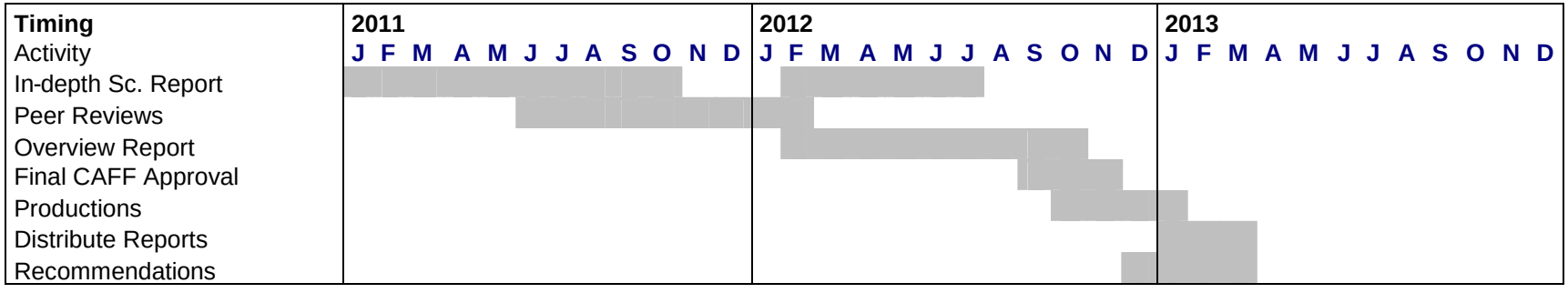
The work for this project will proceed in four phases:

1. Planning, funding, and organisation
2. Information acquisition, analysis, and writing
3. Review, revision, and editing
4. Production

There may be some overlap among these phases. Table 1 shows the proposed schedule.

Table 1: Proposed time schedule





* Assessment Steering Committee

7 Work Plan Organisation

Due to the breadth of this report, it is necessary to have two or more designated lead countries. Finland has offered a co-lead conditional upon one or more additional co-leads. Other countries are currently investigating the possibility of taking on this role.

7.1 Assessment Steering Committee

The co-lead countries will form an Assessment Steering Committee (ASC) in consultation with the CAFF Management Board. The ASC will be comprised of representatives from the CAFF countries, Permanent Participants (PPs), observer countries, observer organizations and the CAFF Secretariat.

The role of the ASC will involve: (1) making key administrative decisions; (2) being responsible for arranging funding in consultation with the CAFF Management Board; and (3) designating contributors who will author chapters or sections, provide information, and/or review chapters or sections according to their areas of expertise and responsibility.

7.2 Secretariat

A secretariat will be needed to handle the day-to-day financial, communication, and operational affairs of the ABA.

7.3 Lead Authors

Lead Authors will be assigned to each chapter, and work under the guidance of the ASC. Authors may be designated by the ASC based on nominations by countries and organisations. The authors will be chosen based on scientific qualifications in the topic area and breadth of understanding of the subject. Lead authors of science chapters will have sufficient international standing in the scientific community and be well enough known for their Arctic scientific accomplishments, to command the attention and cooperation of other contributors. Lead author assignments may include Indigenous Peoples Organisations (IPO) representatives selected by the PPs.

Lead author responsibilities may be developed by the ASC. The lead authors are expected to form writing teams to coordinate and prepare each chapter of the scientific document. Chapter authors and other contributors may share authorship according to standard scientific rules.

7.4 Phase 1: Planning, Funding, and Organisation

It is assumed for the purpose of this work plan that CAFF will arrange funding and establish the ASC. It will be critical for the ASC to:

- Ensure that the eight Arctic Council countries commit sufficient resources and staff time for their experts to author the scientific report chapters or sections according to their respective areas of expertise and responsibility, within the time allotted.
- Involve the six PPs early in planning the project and writing and reviewing chapters according to their areas of expertise and responsibility.
- Facilitate when necessary communication among departments, agencies, and organisations within each Arctic Council country so as to ensure the necessary interdepartmental cooperation for submission and review of information critical to that country's writing assignments.
- Prepare, and keep continually updated, a "prospectus" and associated visual aids so as to inform Senior Arctic Officials (SAO) of the Arctic Council,

cooperating agencies and other interested parties about the goals and progress of the project.

7.5 Phase 1: Opportunities for Economy of Effort

The ASC in collaboration with the CAFF Management Board will examine all reasonable opportunities for collaboration and work sharing with on-going initiatives. This is particularly important for national biodiversity assessments that Arctic Council Parties to the CBD are preparing. Recently completed reviews of Arctic biodiversity topics will be incorporated with any updates to the extent that new information is available. These may include:

- Ecosystem Status and Trends Report for Canada
- NOAA's State of the Arctic reports
- Arctic Council's Arctic Marine Shipping Assessment (AMSA). The report is due in 2008.
- UNEP's fourth Global Environment Outlook, GEO-4, due in early 2008, which will include chapters on biodiversity and polar regions
- Biodiversity data from the Oil and Gas Assessment. The report is due in 2008.
- Biodiversity data from AMAP assessments including the "Updated Assessment of Human Health and Contaminants in the Arctic" (due in 2008) and the "Reviews of 'New POPs' in the Arctic" (due in 2007–2008)
- Early International Polar Year results in 2008 – 2009
- Status and trends data to be compiled by countries by 2009 for the CBD assessment
- Nordic Biodiversity Assessment Project, late 2009 or early 2010
- The Barents Euro-Arctic Council's project 2007 – 2009 impact of climate change on biodiversity and ecosystem goods and services in the Barents Region

7.6 Phase 2: Information Acquisition, Analysis, and Writing

Consultation and Coordination: This work plan assumes that CAFF members, through the ASC, will provide most of the information necessary for the ABA. Contributions may be in forms such as tables, databases, or maps. The ASC will immediately begin consultations with the authors to specify the form and content of contributed manuscripts and other data and to arrange delivery schedules. The Chief Scientist/Editor(s) and the authors' roles are to synthesize information submitted by CAFF agencies, PPs and published peer-reviewed literature. The authors may make maximal use of recent inventories.

7.7 Phase 2: Incorporation of Traditional Ecological Knowledge (TEK)

Only currently available TEK will be included in the ABA. TEK will be incorporated into each chapter. The PPs are the primary source of TEK information for the assessment. The advice of the PPs will be relied upon with regards to the collection and sourcing of TEK.

7.8 Phase 3: Review, Revision, and Editing

The ASC will develop a full, comprehensive and inclusive review process

7.9 Phase 4: Production

The ASC will develop a comprehensive production process

8 Sources of information

Information for the ABA will come from currently existing scientific data and TEK. No new research and monitoring will

be commissioned for this assessment. It will involve large-scale international cooperation and will merge data from many different sources. The assessment will engage the PPs, incorporating data from community-based monitoring projects, and incorporating TEK to every extent possible in order to form a completely balanced picture of the current state of Arctic biodiversity. The following organizations will be asked to contribute to this assessment (inclusive but not limited to):

- CAFF's member state designated agencies:
  - Environment Canada, Ottawa, Canada
  - Finnish Ministry of the Environment, Helsinki, Finland
  - Ministry of the Environment and Nature, Greenland Homerule, Greenland (Kingdom of Denmark)
  - Faroese Museum of Natural History, Tórshavn, Faroe Islands (Kingdom of Denmark)
  - Icelandic Institute of Natural History, Reykjavik, Iceland
  - Directorate for Nature Management, Trondheim, Norway
  - Russian Federation Ministry of Natural Resources, Moscow, Russia
  - Swedish Environmental Protection Agency, Stockholm, Sweden
  - United States Department of the Interior, Fish and Wildlife Service, Anchorage, Alaska
- Indigenous peoples organizations including all PPs to the Arctic Council: The Arctic Athabaskan Council (AAC), Aleut International Association (AIA), Gwich'in Council International (GCI), Inuit Circumpolar Council (ICC), Saami Council and the Russian Association of Indigenous Peoples of the North (RAIPON).
- Observer countries to the Arctic Council (France, Germany, The Netherlands, Poland, United Kingdom, Spain). Countries currently with ad-hoc status are China and Italy.
- Observer organizations to the Arctic Council (including but not limited to): Circumpolar Conservation Union (CCU), International Arctic Science Committee (IASC), IUCN, The North Atlantic Marine Mammal Commission (NAMMCO), The Northern Forum, UNEP/GRID-Arendal, UNEP-WCMC, University of the Arctic, World Reindeer Herders (WRH), World Wildlife Fund (WWF).
- Other international research organizations, institutions, and individual scientists, with possible input also from IPY project scientists

9 Financial Strategy

Preparation of the ABA will require a commitment of dedicated resources from Arctic Council countries. As has been true with most other AC assessments, it is anticipated that the bulk of resources for the ABA will come from in-kind contributions of staff time. Experts within each CAFF country will be expected to contribute data, author chapters and provide peer review. However countries have different budgetary mechanisms and will vary in their abilities to support the salaries and operational costs of staff when assigned to international projects. Some of the authors and data contributors may be supported by their institutes and may not require additional payment of salaries, however, some will require additional funding.

It is recognized that the participation of PPs, who are generally not supported by large bureaucracies and institutions, will depend on financial support. To ensure relevant data from all countries, it is also recognized that some joint programmes may need to be implemented requiring common funding, both

from Arctic countries themselves and other potential funding sources.

It is expected that a large number of people will be required to provide a small amount of time each to the project. A few people will have to be designated close to full-time for the full duration of the project. The project will require a Secretariat or office that manages the day-to-day project administration. The office may be staffed by in-kind contributions but some administrative costs will also be required.

The CBMP indicators have been developed through a workshop process; hence the cost of consultation and workshops in indicator development will be negligible. The bulk of the expense will be to acquire, synthesize and analyse the data, document the methodology and produce the graphics and explanatory text. The science report will be more labour intensive, require a chief scientist and lead authors to ensure credibility of information and many scientific and TEK contributors.

In order to secure continuity in data management and analyses, a large overlap between scientific/TEK contributors to the science report and indicator analysts for the indicator report is required. The final overview report will be short and written by one individual who has a clear understanding of the technical material, such as the Chief scientist.

All products will be subjected to a thorough peer review process to ensure that the data and analysis are credible and that interpretations are sound and accurately reflect the range of expert opinion. Peer review of all recommendations will ensure that advice follows directly from the technical material compiled.

Finland has agreed to co-lead the project and has dedicated some resources. However, their leadership depends on agreement from one or more AC countries to co-lead. Several countries are investigating the possibility of taking on this role. All countries have agreed to provide information and expertise to the best of their abilities. Some countries are already compiling and synthesizing the information required as part of their 4th National Report to the CBD. It is expected that lead countries may apply to national or international funding bodies to support the report development.

9.1 Estimated In-Kind Contributions Over 5 Years

Deliverable	Task	No. of People	Person years	
			2008-2010	2011-2013
Project Management	Secretariat Functions	2	3	3
CBMP Indicators	Technical Coordinator	1	2	
	Indicator Analysts	~ 60	15	
	GIS/web Technician	1	1	
	Peer Review	25-50	2	
Science Report	Chief Scientist	1	1	2
	Lead Authors	6-8	1	6
	Scientist Contributors	~ 60		15
	TEK Expert Contributors	~ 30		7
	GIS Technician	2		2
	Peer Review	25-50		4
Overview Report/ Recommend.	Chief Scientist	1		1
	Peer Review/Policy Review	25-50		2
ESTIMATED IN-KIND CONTRIBUTIONS			**25**	**39**

9.2 Estimated Fixed Costs Over 5 Years

Deliverable	Task	Cost
Project Management/Secretariat	Administration	$100,000
CBMP Indicators	Science writer/editor	$30,000
	Graphics/Web Publication	$50,000
Science Report	Workshops/Meetings	$120,000
	Science writer/editor	$50,000
	Graphics/Web	$10,000
	Publication	$25,000
Overview Report/Recommendation	Workshop/Meetings	$40,000
	Science writer/editor	$40,000
	Graphics/Web	$5,000
	Publication	$10,000
	TOTAL FIXED COSTS	**$480,000.00**

10 Funding Options

Examples of ongoing research and assessment activities relevant to the ABA are given below. The Chief Scientist/Editor(s) will work with the ASC to discuss collaboration and information sharing with the host organisations.

10.1 International Polar Year (IPY)

The IPY runs over three years, 2007–2009. While funding for the central scientific research and organisational costs have been allocated, new funds will probably be launched in the remaining period. For example, Denmark announced that 30,000,000 DKK were to be allocated in 2008 to "accentuate the IPY opportunity." Additionally, several countries have special allocations of funds specifically for data management and archive. Aside from the possibility of direct funding through the IPY, CAFF may be able to arrange for collaboration with researchers and agencies where their objectives overlap with the ABA.

Below is a preliminary list of 15 IPY projects which already have established affiliation with CAFF and its programs (188, 172, 139, 162, 399 and 300) or might be interested in doing so. In some cases, IPY projects need to fulfil IPY data policy guidelines as one of the conditions set for receiving funding from national agencies. CAFF may assist project leaders in fulfilling data management requirements of IPY by offering data archive services. One possibility is by providing a data archive through the CAFF website with integrated, interactive mapping in exchange for IPY project contribution of data for the ABA. This effort would be part of the build up of regional data for the Arctic, which then would feed into global assessments.

A letter of invitation for cooperation will be sent out to the project leaders of the following IPY projects (IPY project number follows in parentheses):

- Arctic and Subarctic Ecosystems (155)
- Biological Diversity Network (72)
- Biodiversity of Arctic Char (300)
- Bird Health (172)
- Freshwater Biodiversity Network (202)
- Greening of the Arctic (139)
- Human Rangifer Migrations (408)
- Marine Biodiversity (333)
- MERGE (Microbial and Ecological Response to Global Environmental Change in Polar Regions) (55)
- Protected Natural Areas (284)
- Rangifer Monitoring (162)
- Reindeer Herding and Climate Change (399)
- Terrestrial Ecosystems (59)
- Tundra Experiment (188)
- Wildlife Observations (11)

10.2 Convention on Biological Diversity (CBD)

The CBD Secretariat and CAFF may achieve efficiencies and economies of scale by coordinating their assessments. At the very least, the ABA should benefit from the work of the Parties to the CBD who are preparing for their 4th National Reports to the CBD.

10.3 World Conservation Monitoring Centre (WCMC)

The WCMC is a potential partner and service provider. It has considerable experience in global assessments, particularly of the marine environment and Arctic biota (Chape et al. 2005; Groombridge & Jenkins 1998, 2002; Groombridge & Jenkins 1996a; Groombridge & Jenkins 1996b; UNEP 2003; Zöckler 1998; Zöckler & Lysenko 2000). WCMC has already approached CAFF with a proposal to act as a coordinating body for the ABA.

10.4 UNEP/GRID-Arendal

UNEP/GRID–Arendal is a potential partner or service provider, particularly in the area of cartography (Ahlenius 2005,

2007; Ahlenius et al. 2005). It has considerable experience in integrating diverse data sets and making them understandable to broad audiences. CAFF has received a proposal from WCMC and UNEP/GRID–Arendal to provide services to the ABA on a fee for service basis.

10.5 Global Environment Facility (GEF)

GEF, the world's largest financier of global environmental protection projects, funds biodiversity diversity programmes and projects that respond to the CBD priorities and strategic plans. Countries and NGOs can apply if their projects meet established criteria. Biodiversity conservation is one of the GEF's core priorities. Since 1991, the GEF has invested nearly $4.2 billion in grants and co-financing for biodiversity conservation. As the financial mechanism for the CBD, the GEF helps countries fulfil their obligations under the CBD.

It may be possible to "piggyback" ABA activities by partnering with groups that are already funded by GEF, or that may seek funding for this purpose. For example, many GEF-accredited NGOs are based in Arctic Council countries. GEF has detailed guidance on its Web sites for proponents considering making funding requests, as well as guidance in making submissions.

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Appendix 1: Advisors for the Work Plan

Agency	*Name*	*Country*
Aleut International Association	Victoria Gofman	USA
All-Russia Research Institute for Nature Protection	Dmitry M. Ochagov	Russia
All-Russia Research Institute for Nature Protection	Stanislav E. Belikov*	Russia
All-Russia Research Institute for Nature Protection; UNEP/GEF ECORA Project	Evgeny A. Kuznetsov*	Russia
Arctic Athabaskan Council	Cindy Dickson*	Canada
Arctic Athabaskan Council	Terry Fenge*	Canada
CAFF International Secretariat	Tom Barry*	Iceland
CBird & Icelandic Institute of Natural History	Aevar Petersen	Iceland
CBIRD and Fishery Research Institute	Bergur Olsen*	Faroe Isl.
CIS WORKING Group on Waders	Mikhail Yu. Soloviev	Russia
Direktoratet for Naturforvaltning	Berit Lein	Norway
Environment Canada	Derek Muir*	Canada
Environment Canada	Mike Gill*	Canada
Environment Canada	Russell Shearer*	Canada
Environment Canada	Risa Smith*	Canada
Finnish Environment Institute	Mikael Hildén	Finland
Finnish Environment Institute	Esko Jaakkola*	Finland
Fisheries and Oceans Canada	Jim Reist*	Canada
Greenland Institute of Natural Resources	Lars Witting	Greenland
Gwich'in Council International	Bobbie Joe Greenland*	Canada
Gwich'in Council International	Bridgette Larocque*	Canada
Gwich'in Council International	Mary Ann Ross	Canada
Indian and Northern Affairs Canada	Ruth McKechnie*	Canada
Indian and Northern Affairs Canada	Terry Baker *	Canada
Indigenous Peoples' Secretariat	Rune Fjellheim	Greenland
Institute of Geography	Arkadiy A. Tishkov	Russia
International Division, Direktoratet for Naturforvaltning	Finn Katerås*	Norway
Inuit Circumpolar Council	Aqqaluk Lynge	Greenland
Inuit Circumpolar Council	Duane Smith	Canada
Inuit Circumpolar Council Canada	Carole Simon	Canada
Inuit Circumpolar Council Canada	Patricia Cochran	Canada
Ministry of Environment and Nature, CAFF Chair	Inge Thaulow*	Greenland
Museum of Natural History	Anna Maria Fossaa	Faroe Isl.
National Environmental Research Institute	Anders Mosbech*	Denmark
National Environmental Research Institute	Flemming R. Merkel*	Denmark
PAME	Soffía Guðmundsdóttir*	Iceland
RAIPON	Vladimir Bocharnikov*	Russia
RAIPON	Mikhail Todishev	Russia
RAIPON and CSIPN/RITC	Rodion Sulyandziga	Russia
Research Institute of Problem of Ecology and Evolution, Russian Academy of Sciences	Evgeny E. Syroechkovsky	Russia
RF Ministry of Natural Resources	Valery Orlov	Russia
Saami Council	Gunn-Britt Retter*	Norway
Swedish Environmental Protection Agency	Mark Marissink*	Sweden
Swedish environmental Protection Agency	Sune Sohlberg	Sweden
U.S. Fish and Wildlife Service, Alaska	Janet E. Hohn*	USA
World Conservation Monitoring Centre	Charles Besançon*	UK

* Interviewed or sent written replies.

Appendix 2: Acronyms

AAC	Arctic Athabaskan Council
ABA	2010 Arctic Biodiversity Assessment
ACIA	Arctic Climate Impact Assessment
AIA	Aleut International Association
AMAP	Arctic Monitoring and Assessment Programme
AMSA	Arctic Marine Shipping Assessment
AMSP	Arctic Marine Strategic Plan
ASC	Assessment steering committee
CAFF	Conservation of Arctic Flora and Fauna
CBD	Convention on Biological Diversity
CCU	Circumpolar Conservation Union
CBMP	Circumpolar Biodiversity Monitoring Program
GCI	Gwich'in Council International
GEF	Global Environment Facility
IASC	International Arctic Science Committee
ICC	Inuit Circumpolar Council
IPCC	Intergovernmental Panel on Climate Change
IPO	Indigenous Peoples' Organisations
IPY	International Polar Year
IUCN	World Conservation Union
NAMMCO	The North Atlantic Marine Mammal Commission
PAME	Protection of the Arctic Marine Environment
RAIPON	Russian Association of Indigenous Peoples of the North
SAO	Senior Arctic Officials
TEK	Traditional Ecological Knowledge
UN	United Nations
UNEP	United Nations Environment Programme
WCMC	World Conservation Monitoring Centre
WRH	World Reindeer Herders
WWF	World Wildlife Fund

Appendix 3: Summary of CBMP Indicators and Indices relationship to CBD Indicators and Indices

CBMP Indicators and Indices	Linkage with CBD Indicators (yes/no)
Composition: Species	
Arctic Species Trend Index	√
Trends in Abundance of Key Species + Trends in other species parameters (e.g. distribution, productivity, survival, body condition, etc.)	√
Arctic Red List Index	√
Change in Status of Threatened Species	√
Trends in Total Species Listed at Risk	X
Structure	
Arctic Trophic Level Index	√
Water Quality Index	√
Composition: Habitat	
Arctic Land Cover Change Index	X
Trends in Extent of Biomes, Habitats and Ecosystems	√
Arctic Habitat Fragmentation Index	X
Trends in Patch size distribution of Habitats	X
Fragmentation of River Systems	√
Extent of Seafloor Destruction	X
Ecosystem Function & Services	
Trends in Extent, Frequency, Intensity and Distribution of Natural Disturbances	X
Trends in phenology	X
Trends in Decomposition Rates	X
Human Health & Well-being	
Arctic Human Well-being Index	X
Trends in availability of biodiversity for traditional food and medicine	√
Trends in Linguistic Diversity	√
Trends in use of Traditional Knowledge in research, monitoring and management	X
Trends in incidence of pathogens and parasites in wildlife	X
Response	
Coverage of Protected Areas	√

Appendix 4: Detailed chart on CBMP indicators and indices

*= indices closely related to the Convention on Biological Diversity indicators or a subset of the global indicator, **= index suggested for inclusion in the Millenium Development Goals.

THEME	INDEX	INDICATOR	ELEMENTS	SUB-ELEMENTS	NETWORK LEADS	CURRENT MONITORING AND REPORTING CAPACITY
Composition: Species	Arctic Species Trend Index*	Trends in Abundance of Key Species + Trends in other species parameters (e.g. distribution, productivity, survival, body condition, etc.)	Terrestrial	Wild *Rangifer (Caribou/Reindeer)*	CARMA	Yes
				Invasive Species	NatureServe International	Partial (incomplete geographic coverage)
				Invertebrates	None	No
				Landbirds	US Fish and Wildlife Service, Canadian Wildlife Service, etc.	Partial (incomplete geographic coverage and statistical deficiencies)
				Predators (e.g. foxes, wolves, lynx, snowy owls, eagles, etc.)	Russian Wildlife Census Service and other national and regional census organizations	Partial (incomplete geographic coverage and statistical deficiencies)
				Brown Bears	Northern Forum Brown Bear Network	Partial (incomplete geographic coverage)
				Lemmings	Moscow State University; University of Helsinki	Partial (incomplete geographic coverage)
				Human Populations	National Census Organizations	Yes
			Marine	Commercial Species (e.g. Cod, flatfish, Pollock, salmon)	ICES, FAO, NOAA, University of British Columbia	Partial (incomplete geographic coverage)
				Invertebrates (e.g. benthos, phytoplankton, zooplankton)	Census of Marine Life	Partial (incomplete geographic coverage and statistical deficiencies)
				Polar Bears	IUCN Polar Bear Specialist Group	Partial (incomplete geographic coverage)

THEME	INDEX	INDICATOR	ELEMENTS	SUB-ELEMENTS	NETWORK LEADS	CURRENT MONITORING AND REPORTING CAPACITY
				Ringed Seals	US Marine Mammal Commission	Partial (incomplete geographic coverage)
				Whales	US Marine Mammal Commission	Partial (incomplete geographic coverage and statistical deficiencies)
				Seabirds	Circumpolar Seabird Group	Yes
				Invasives	Census of Marine Life	Partial (incomplete geographic coverage and design deficiencies)
			Aquatic	Waterbirds	Wetlands International and IUCN Goose Specialist Group	Yes
				Arctic Char	Char Network	In Development
				Invertebrates	Freshwater Biodiversity Network	In Development
				Invasives	NatureServe International	Partial (incomplete geographic coverage and design deficiencies)
	Arctic Red List Index**	Change in Status of Threatened Species	Biomes (Marine, Terrestrial, Aquatic)		IUCN in collaboration with EMGs	Yes
			Species Groupings (e.g. mammals, birds, etc.)		Marine Mammal Commission, BirdLife International	Yes
		Trends in Total Species Listed at Risk	Biomes (Marine, Terrestrial, Aquatic)		IUCN	Yes
			Species Groupings (e.g. mammals, birds, etc.)		IUCN	Yes

THEME	INDEX	INDICATOR	ELEMENTS	SUB-ELEMENTS	NETWORK LEADS	CURRENT MONITORING AND REPORTING CAPACITY
Structure	Arctic Trophic Level Index*		Biomes (Marine, Terrestrial, Aquatic)		University of British Columbia, UNEP – WCMC	Partial (Marine – incomplete geographic coverage; Aquatic and Terrestrial – No current capacity)
	Water Quality Index*		Aquatic		UNEP GEMS Water, Canada	
Composition: Habitat Extent	Arctic Land Cover Change Index	Trends in Extent of Biomes, Habitats and Ecosystems	Terrestrial	Tundra, Forest, Glaciers, Shrubs, Snow Cover	CAFF Flora Group, FAO	Partial (incomplete coverage of sub-elements)
				Human Footprint (Urban, Agriculture, Roads, Seismic, other)	UNEP GRIDA (GLOBIO)	Partial (incomplete coverage)
			Aquatic		University of Alaska Fairbanks	Partial (incomplete coverage (Siberia and Alaska only)
			Marine	Sea Ice, Plankton Distribution, Corals	Various Universities and National Ice Services	Yes
Composition: Habitat Quality	Arctic Habitat Fragmentation Index	Trends in Patch size distribution of Habitats	Terrestrial		GLOBIO and Universities	Partial (incomplete coverage)
		Fragmentation of River Systems	Aquatic		CAFF countries	Yes
		Extent of Seafloor Destruction	Marine			No
Ecosystem Function & Services		Trends in Extent, Frequency, Intensity and Distribution of Natural Disturbances	Terrestrial	Forest and Tundra Fires	CAFF countries	Yes
				Forest Insect Outbreaks	CAFF countries	Yes
				Forest Disease Outbreaks	CAFF countries	Yes
		Trends in phenology	Terrestrial	Plants	ITEX, GLORIA	Yes
			All Biomes	Migration Timing	Various	Partial (incomplete coverage)
		Trends in Decomposition Rates	Terrestrial	Tundra	ITEX, GLORIA	Yes

THEME	INDEX	INDICATOR	ELEMENTS	SUB-ELEMENTS	NETWORK LEADS	CURRENT MONITORING AND REPORTING CAPACITY
				Forest		
Human Health & Well-being	Arctic Human Well-being Index	Trends in availability of biodiversity for traditional food and medicine			SLICA?	Partial (incomplete coverage)
		Trends in Linguistic Diversity			ITK? And CAFF countries	Partial
		Trends in use of Traditional Knowledge in research, monitoring and management				No
		Trends in incidence of pathogens and parasites in wildlife			CARMA, CHAR	In development
Response		Coverage of Protected Areas	Coverage according to IUCN categories		UNEP-WCMC	Yes
			Overlays with areas of key importance (biodiversity hotspots)		UNEP-WCMC	No
			Biomes (marine, terrestrial, aquatic)		UNEP-WCMC	Yes